

## **4.2 AIR QUALITY**

This section discusses the environmental setting for air quality in the vicinity of all potential project-related activities, and analyzes the impacts of air emissions generated by the Proposed Project. This analysis addresses the potential issues of concern identified in the State CEQA Guidelines, Environmental Checklist Form, and the applicable rules and regulations of the affected air basin and air districts.

### **4.2.1 Regional Setting**

This section describes the existing environment for air quality in the vicinity of all project related activities and alternatives, including the jurisdictional boundaries for air quality management, physical geography, climatology, meteorology, and air pollutants of concern.

#### **4.2.1.1 South Central Coast Air Basin**

The majority of Project-related activities shall occur within the South Central Coast Air Basin (SCCAB), which includes Santa Barbara, Ventura, and San Luis Obispo Counties, although some transport of pier debris for recycling will occur in the Port of Long Beach in the South Coast Air Basin (SCAB) (see Figure 4.2-1). These are two of 15 basins into which the California Environmental Protection Agency - Air Resources Board (CalEPA-ARB) has divided the State for the purpose of managing air quality on a State and regional basis. Each air basin is characterized as having relatively uniform internal air quality and meteorological conditions.

The proposed pier removal operation would be located within the SCCAB. All transportation routes of personnel and/or equipment to the pier location from Ellwood Pier would also be located within the SCCAB. Mobilization and demobilization of the Barge Siuslaw and all other Project vessels, and transport of recovered materials to and from the Port of Long Beach would traverse a small portion of the SCAB.

#### **4.2.1.2 Air Pollution Control Districts**

##### **Santa Barbara Air Pollution Control District**

The Santa Barbara County Air Pollution Control District (SBCAPCD) has jurisdiction over the Santa Barbara County portion of the SCCAB. The SBCAPCD regulates local sources of air pollution and is responsible for bringing local air quality into compliance with State and federal ambient air quality standards. While the CalEPA-ARB regulates emissions from mobile sources, including motor vehicles and marine vessels, the local air districts have primary responsibility for controlling air pollution from stationary sources, such as construction sites.

The PRC-421 Pier is located offshore the Santa Barbara County coast. Thus, all the proposed work activities at the project location would be regulated by the SBCAPCD in coordination with CalEPA-ARB.



**Figure 4.2-1. CalEPA Air Resources Board Air Basin Boundaries.**  
(Source: [www.arb.ca.gov](http://www.arb.ca.gov))

### **South Coast Air Quality Management District**

The South Coast Air Quality Management District has jurisdiction over project activities at Long Beach during vessel mobilization and at Catalina Island during loading of quarry rock.

#### **4.2.1.3 Physical Environment**

All project-related activities would take place offshore Santa Barbara County in the coastal portions of the SCCAB as shown in Figure 4.2-1. Therefore, the discussion of

topographic and meteorological settings emphasizes the coastal environment within the study region.

## Topographic Setting

General weather patterns are strongly affected by surrounding topographical features. The Santa Barbara Channel is about 60 nautical miles long and 20 nautical miles wide oriented west-northwest to east-southeast. At the western end of the Channel, the coastline turns abruptly from an east-west orientation to north-south near Point Arguello and Point Conception. Mountain ranges parallel the shores of the Channel both to the north and to the south. The Santa Ynez Mountains rise just north of Point Conception and lie in an east-west orientation, rising to 3,000-4,000 ft (914-1,219 m) north of Goleta and Santa Barbara and to 5,000 ft (1,524 m) north of Ventura. The Santa Monica Mountains arise from the coastal plain east of Ventura and lie in an east-west orientation rising to about 2,000 ft (610 m) north of Santa Monica. The coastal plain ranges from extremely narrow up to about 4 mi (6.4 km) wide in the Goleta-Santa Barbara area. The Channel Islands are mountainous, rising from about 800 ft (244 m) on San Miguel Island to 2,400 ft (732 m) on Santa Cruz Island and descending to about 100 ft (30.5 m) at Anacapa Island. Passes and canyons along the southern slopes mark the coastal ranges. The Channel Islands have narrow ocean passages between them.

## Climate and Air Pollution Meteorology

Weather patterns in the SCB are dominated by the Pacific high-pressure system (Trewartha 1954). This subtropical high-pressure system produces a net weak southerly and onshore flow with the area (Dorman 1982). During the summer, the high-pressure system strengthens and moves to the North Pacific creating prevailing west-to-northwesterly winds along the coast. The system weakens during the winter, moves south, and allows the Aleutian low-pressure system to spawn storms, which occasionally migrate through the southern California area. The Pacific High, the temperature differential between land and sea, and local geography combine to produce a Mediterranean climate characterized by partly cloudy, cool summers (relative to inland areas) with little precipitation, and mild winters during which precipitation may fall from migrating storms (Trewartha 1954). Occasionally, a high-pressure area develops over the desert area east of the SCB, reversing the surface pressure gradient and generating strong, dry, gusty offshore winds ("Santa Anas") in the coastal area (Dailey et al. 1993).

The climate of Santa Barbara County is semi-arid Mediterranean, characterized by warm, dry summers and cooler winters with moderate precipitation. Temperatures are more moderate near the coastline than inland, with average daily summer highs of 70°F (21°C) and average daily winter lows of 40°F (4.4°C). Inland areas experience a wider range of temperatures, from an average summer high in the 80s and 90s (°F) (26.7°C to 32.2°C) to an average winter low in the 30s (1.1°C). Most precipitation occurs during the months of November through April, with annual rainfall ranging from 10 to 18 inches (25.4 to 45.7 cm) along the coast, while slightly greater amounts fall in the higher elevations. Prevailing winds in the coastal region are from the west/northwest during the day, averaging 7 to 12 mi (19 km) per

hour. Evening winds blow from the east, as the air over the Pacific Ocean cools and creates a low pressure zone (Mobil 1995).

The atmospheric condition in which warmer air is present above cooler air is termed a temperature inversion. Two kinds of inversions can occur: surface inversions and subsidence inversions. Surface inversions occur most frequently during the fall and winter when the ground surface cools on cloudless nights. The surface then cools the adjacent air. Surface inversions typically breakup in the late morning when the sun heats the ground sufficiently. Subsidence inversions occur most frequently during the spring and summer when the land heats more quickly than the adjacent ocean surface during the day. This differential causes the air over land to rise, subsequently drawing in the cooler, denser ocean air. The result is stable, cool air near the ground surface, and warm air aloft (SCAQMD 1993).

Persistent inversion layers limit vertical mixing and can trap air pollutants. Maximum pollutant concentrations can occur when strong, persistent inversions and relatively low wind speed coincide (Mobil 1997).

#### **4.2.2 Air Pollutants**

All Project components are located within the Santa Barbara County portion of the South Central Coast Air Basin. Ozone is the primary pollutant of concern in Santa Barbara County. Ozone is formed in the atmosphere through photochemical reactions involving sunlight, oxygen, oxides of nitrogen, and hydrocarbons. Ozone concentrations tend to be highest during late morning and early afternoon when solar radiation is most intense.

Air quality standards are specific concentrations of pollutants that are used as thresholds to protect public health and the public welfare. The U.S. Environmental Protection Agency (EPA) has developed two sets of standards; one to provide an adequate margin of safety to protect human health, and the second to protect the public welfare from any known or anticipated adverse effects. At this time, sulfur dioxide is the only pollutant for which the two standards differ. The California Air Resources Board (CARB) has also developed air quality standards for California.

In July 1997, EPA finalized new health-based ozone and particulate matter (PM) standards. However, due to several lawsuits, the standards were not fully implemented until February 2001. The new federal ozone standard is based on a longer averaging period (8-hour vs. 1-hour), recognizing that prolonged exposure is more damaging. The new federal PM standard is based on finer particles (2.5 microns [ $PM_{2.5}$ ] and smaller vs. 10 microns and smaller [ $PM_{10}$ ]), recognizing that finer particles may have a higher residence time in the lungs and cause greater respiratory illness. Table 4.2-1 lists applicable State and federal air quality standards.

**Table 4.2-1. Ambient Air Quality Standards**

Pollutant	Averaging Time	State Standard	Federal Standard
Ozone	1-Hour	0.09 ppm	
	8-Hour	--	0.08 ppm
Carbon Monoxide (CO)	1-Hour	20 ppm	35 ppm
	8-Hour	9.0 ppm	9 ppm
Nitrogen Dioxide (NO <sub>2</sub> )	1-Hour	0.25 ppm	--
	Annual Average	--	0.053 ppm
Fine Particulate Matter (PM <sub>2.5</sub> )	24-Hour	--	50 µg/m <sup>3</sup>
	Annual Arithmetic Mean	12 µg/m <sup>3</sup>	15 µg/m <sup>3</sup>
	Annual Geometric Mean		--
Inhalable Particulate Matter (PM <sub>10</sub> )	24-Hour	50 µg/m <sup>3</sup>	150 µg/m <sup>3</sup>
	Annual Geometric Mean	20 µg/m <sup>3</sup>	--
	Annual Arithmetic Mean	--	50 µg/m <sup>3</sup>
Sulfur Dioxide (SO <sub>2</sub> )	1-hour	0.25 ppm	--
	24-Hour	0.04 ppm	0.14 ppm
		--	

The air quality of Santa Barbara County is monitored by the California Environmental Protection Agency, Air Resources Board (ARB), Santa Barbara County Air Pollution Control District (APCD), and industry. Air quality monitoring stations operated by the ARB and the APCD are part of the State and Local Air Quality Monitoring System (SLAMS). The majority of the monitoring stations are operated by industry under protocols developed by the APCD as required by permit conditions to detect Project-related impacts. These stations are referred to as Prevention of Significant Deterioration (PSD) stations.

#### 4.2.2.1 Primary Air Pollutants

Primary air pollutants are those emitted directly from sources. Sulfur dioxide (SO<sub>2</sub>) is a gas derived from the burning of fossil fuels that contain sulfur compounds as well as from oil and gas production and processing. It is colorless and odorless at low concentrations, but very pungent at high concentrations. SO<sub>2</sub> forms secondary acidic aerosols that damage lung tissue and corrode building materials and finishes.

Fine particulate matter is composed of natural and artificial substances and is present in the atmosphere as both solid particles and aerosols (liquid droplets). Primary sources of particulate matter are fossil fuel combustion, dust from roads and ground disturbing activities, and fires. The haze characteristic of smog is made up of fine particulates. PM<sub>10</sub> is the particulate matter that is up to 10 micrometers (µm) in diameter (about 1/7 the thickness of a human hair). PM<sub>10</sub> is a health concern because such particulate matter can be inhaled deeply

into the lungs and impair lung function. Concern over even smaller particulates, which can be inhaled even more deeply into the lungs led the U.S. Environmental Protection Agency (EPA) to adopt additional standards for PM<sub>2.5</sub> (up to 2.5 µm in diameter).

#### 4.2.2.2 Secondary Air Pollutants

Secondary air pollutants are produced during pollutant transport in the atmosphere.

A secondary source of fine particulate matter (PM<sub>10</sub>) is the chemical conversion of gases, such as NO<sub>2</sub>, SO<sub>2</sub>, and ammonia, into nitrate, sulfate, and organic aerosols.

Nitrogen dioxide (NO<sub>2</sub>) is derived from nitrogen oxide (NO), which is produced during the combustion of fossil fuels and then quickly reacts in the atmosphere to form NO<sub>2</sub>. The mixture of these primary (NO) and secondary (NO<sub>2</sub>) nitrogen oxides is commonly referred to as NO<sub>x</sub>. NO<sub>2</sub> produces the distinctive brownish color of smog haze and can cause eye, nose, and throat irritation, as well as reduce plant growth. NO<sub>2</sub> is one of the main precursors to ozone and can be a source of PM<sub>10</sub> (see below).

Sulfates (SO<sub>4</sub>) are compounds in particulate aerosols derived from SO<sub>2</sub>. They can aggravate respiratory and pulmonary diseases, reduce visibility, and cause damage to vegetation. Nitrate (NO<sub>3</sub>) aerosols have similar deleterious effects.

Ozone (O<sub>3</sub>) is derived from two main precursors, NO<sub>x</sub> and reactive organic compounds (ROC). (ROCs escape into the atmosphere from motor vehicles, oil and gas production and processing, solvents, and many consumer products.) Ozone is colorless and odorless and is used to define oxidant air quality standards. The oxidants in smog cause breathing difficulties, eye irritation, and other adverse effects. Ozone also damages vegetation, rubber, and other materials.

#### 4.2.3 Local Air Quality

Santa Barbara County's air quality has historically violated State and federal ozone standards. The County recently and by a small margin attained the federal ozone standard, but does not meet the State standards for ozone or PM<sub>10</sub>. For other criteria pollutants, such as CO and SO<sub>x</sub>, the County is either in attainment or unclassified. Santa Barbara County is now implementing its 1998 Clean Air Plan (approved by the EPA in June 2000), which represents a partnership among the County Air Pollution Control District (APCD), CARB, EPA, Association of Governments, local businesses, and the community-at-large to reduce pollution from all sources.

The nearest station to Pier PRC-421 is the West Campus (University of California at Santa Barbara) station, was located about 2 mi (3.2 km) to the east. This station monitored ozone, nitrogen dioxide (NO<sub>2</sub>), hydrogen sulfide (H<sub>2</sub>S), and hydrocarbons, with sulfur dioxide (SO<sub>2</sub>) and particulate matter (PM<sub>10</sub>) monitors added in 1994. While monitoring at this station was discontinued in July 1998, the data provide local air quality information that remains valid. Maximum concentrations and number of exceedances of air quality standards monitored at the

West Campus station are presented in the following Table 4.2-2. These air quality data indicate that the State 1-hour standard for ozone (0.09 ppm) is rarely exceeded at this station. In addition, the federal ozone standard has not been exceeded at this station since 1992. Data have also been collected at El Capitan Beach, approximately 7 mi (11.3 km) to the west. Air quality at this station is similar to the West Campus station (see Table 4.2-2).

**Table 4.2-2. Air Quality Standard Exceedances**

Pollutant	West Campus			El Capitan	
	1996	1997	1998	2001	2002
<b>Ozone (ppm)</b>					
Worst 1-hour period	0.110	0.092	0.100	0.092	0.075
Worst 8-hour period	0.078	0.079	0.082	0.078	0.068
Number of State 1-hour exceedances	2	0	1	0	0
Number of Federal 1-hour exceedances	0	0	0	0	0
Number of Federal 8-hour exceedances	0	0	0	0	0
<b>Sulfur Dioxide (ppm)</b>					
Worst 24-hour period	0.003	0.002	0.001	0.002	0.001
Number of State 24-hour exceedances	0	0	0	0	0
Number of Federal 24-hour exceedances	0	0	0	0	0
Number of Federal annual exceedances	0	0	0	0	0
<b>Nitrogen Dioxide (NO<sub>2</sub>)</b>					
Worst Hour	0.071	0.054	0.043	0.046	0.0450 .047
Number of State 1-hour exceedances	0	0	0	0	0
Number of Federal annual exceedances	0	0	0	0	0
<b>PM<sub>10</sub> (micrograms/cubic meter)</b>					
Worst Sample	40.4	59.8	32.9	40.3	22.6
Number of State 24-hour exceedances	0	1	0	0	0
Annual Geometric Mean	23.5	25.7	20.0	17	17
Annual Arithmetic Mean	24.9	27.9	20.1	19	19

#### **4.2.4 Applicable Regulations**

The EPA and CARB developed ambient air quality standards to protect public health and welfare. These standards were presented above in Table 4.2-1.

The SBCAPCD requires permits for new, or modifications to existing, air pollution-emitting facilities. Facility operators are required to obtain an Authority to Construct (ATC) before construction or modification begins. The APCD integrates State and federal requirements for new source review into its ATC process. SBCAPCD has established quantitative thresholds by which to assess the significance of long-term air emissions from proposed projects. SBCAPCD's Scope and Content of Air Quality Sections in Environmental Documents (1998) provides criteria to determine if a project will have a significant impact on the environment. These significance criteria are listed below in Section 4.2.5.2.

In response to the publication of the Draft EIR for the original project, the SBCAPCD expressed concerns about compliance with the requirements of 40 CFR Part 61 – National Emission Standards for Hazardous Air Pollutants (NESHAPS), specifically because the SBCAPCD suspected that the caissons contained asbestos. However, subsequent testing has shown that the caissons are composed of 100 percent non-asbestos, non-fibrous material (see Section 4.5, Hazards, in this Draft EIR). Thus, this regulation does not apply to either the Proposed Project, or alternative project.

Pursuant to SBCAPCD Rule 202, equipment used for Proposed Project demolition and construction activities are subject to a SBCAPCD permit.

#### **4.2.5 Impacts and Mitigation Measures**

The Proposed Project would not be subject to the above-mentioned thresholds because it is a short-term removal project, and would not result in any long-term operations, other than an possible infrequent boat trips for bird roosting/nesting platform visitation/maintenance that could result in substantial long-term air emissions. In addition, the Santa Barbara County Air Pollution Control District (SBCAPCD) has not set quantitative thresholds to assess the significance of air emissions from short-term construction projects. However, SBCAPCD does indicate that standard mitigation measures provided in their impact assessment guidelines should be included as part of all construction projects to minimize air emissions. Air quality impacts associated with the Proposed Project would not be significant because these standard mitigation measures are to be implemented during construction.

##### **4.2.5.1 Methodology**

Air emissions from the Proposed Project will result primarily from diesel main engines and generator units on the support vessels and the diesel driven crane and swing engines on the Heavy Lift Derrick Barge. The vessels and their equipment are described in Section 3.0–Project Description.



Emissions are calculated as a function of the estimated hours of operation in various modes and emission factors taken from EPA Compilation of Air Pollutant Emission Factors, AP-42, Fifth Edition, Volume 1, Chapter 3, Stationary Internal Combustion Sources. The hours of operation for each of the vessels reflect a 12-hour work day and 12-hour idle, each day except for the crew boat, which will make unscheduled trips to Ellwood Pier for personnel and supplies and spend the remainder of the time idle on station. Reasonable estimates of the duration of the Proposed Project and numbers of trips have been made to determine the total hours of operation.

#### 4.2.5.2 Significance Criteria

According to SBCAPCD's Scope and Content of Air Quality Sections in Environmental Documents (1998), a project will have a significant impact on air quality if the project would:

- Emit (from all project sources, both stationary and mobile) 240 pounds per day (ppd) or greater of ROC (reactive organic compounds) or NO<sub>x</sub> (oxides of nitrogen), or 80 ppd or greater PM<sub>10</sub> (particulate matter, diameter ≤ 10 μm) (these values do not apply to this short-term project);
- Emit 25 ppd or greater of NO<sub>x</sub> or ROC from motor vehicle trips only;
- Cause or contribute to a violation of any California or National Air Quality Standard (except ozone);
- Exceed the APCD health risk public notification thresholds adopted by the APCD Board, or;
- Be inconsistent with the adopted federal or State air quality plans for Santa Barbara County.

APCD Rule 202F.3 requires emission offsets for emissions of construction equipment exceeding 25 tons of any pollutant during a 12 month period. This Rule indicates that 25 tons of emissions may result in substantial regional air quality impacts. Emissions of the subject Project are associated with short-term construction-related activities (demolition of existing structures, construction of roosts). Therefore, 25 tons is used as a threshold of significance for the Proposed Project.

#### 4.2.5.3 Air Quality Impacts

**Short-term Impacts.** The following are the potential impacts of the Proposed Project during its demolition and construction phase.

## AIR-1: Vessel and Equipment Emissions.

### *Discussion:*

Emissions are, in part, a function of the size of the engine, its load, its fuel efficiency, and its hours of use. Table 4.2-3 provides estimates of these items for the equipment proposed for use on the Proposed Project.

**Table 4.2-3. Equipment Characteristics**

Vessel (operating mode)	Equipment	HP	Hours Used	Load Factor <sup>1</sup>	BSFC (gal/Bhp)	Control Type
<b><i>M/V Kahu</i></b>						
	Mains	2220		0.65	0.055	4
	Generator set	99		0.3	0.055	4
<b><i>Barge Siuslaw</i></b>						
	Anchor winches	720		0.3	0.055	1
	Crane	333		0.3	0.055	1
	Small tool compressor	49		0.85	0.055	1
	Large tool compressor	80		0.85	0.055	1
	Small dive compressor	20		0.85	0.055	1
	Large dive compressor	40		0.85	0.055	1
	Welder	38		0.85	0.055	1
	Water blaster	230		0.85	0.055	1
	Jet pump	230		0.85	0.055	1
<b><i>Tug Julie</i></b>						
	Mains	800		0.65	0.055	2
	Generator set	40		0.3	0.055	1
<b><i>Tug Larcona</i></b>						
	Mains	2000		0.65	0.055	3
	Generator set	43		0.3	0.055	1

<sup>1</sup> Please refer to January 12, 2004, memorandum from M.F. Strange & Associates at the end of Appendix S regarding the calculation and use of load factors.

Emission controls include four-degree ignition timing retard, turbo-charging, after (inter)-cooling, advanced electronic engine controls (Tug Kahu) and the use of very low sulfur (0.05% weight sulfur) diesel fuel (TI = turbocharged and inter-cooling). Table 4.2-4 provides the emission factors for the types of equipment to be used.

The emission factors, coupled with the engine-use, provide the estimate of total emissions for the Proposed Project. The results of these calculations are provided in Table 4.2-5. These emissions would occur during the 26 day duration of the Proposed Project.

**Table 4.2-4. Emission Factors**

Emission Controls		Emission Factors (lb/1000 gal)					
Type	Description	NO <sub>x</sub>	ROC	CO	SO <sub>x</sub>	PM	PM <sub>10</sub>
1	Uncontrolled	561	49	129.3	40.8	42.2	40.5
2	Controlled TI	449	49	129.3	40.8	42.2	40.5
3	Controlled Mains	337	16.8	78.3	28.2	33.0	31.7
4	Electronic engine controls	246	16.8	78.3	28.2	33.0	31.7

**Table 4.2-5. Project Emissions**

Activity	Estimated Maximum Emissions (lb)					
	NO <sub>x</sub>	ROC	CO	SO <sub>x</sub>	PM	PM <sub>10</sub>
Barge transit from Long Beach	488.4	28.6	132.4	47.6	55.7	53.5
Barge Anchoring	67.4	4.9	18.1	6.2	7.0	6.7
Remove topsides	540.3	48.1	144.5	47.4	51.0	49.0
Remove Seabed Debris	876.4	80.1	218.1	69.5	72.7	69.7
Topple columns	200.5	14.3	47.2	15.9	17.5	16.8
Recover Debris	1055.4	91.6	270.1	88.1	94.4	90.6
Nest columns	719.3	61.5	196.1	65.3	71.4	68.5
Drive piles	989.9	90.2	259.9	84.3	89.6	86.1
Place quarry rock	1811.5	135.0	499.3	151.4	167.0	160.4
Install roost platforms	630.9	54.3	165.3	54.4	58.8	56.4
Debris survey	321.6	27.7	84.1	27.7	29.9	28.7
Remove barge anchors	243.0	16.7	64.7	22.5	25.7	24.6
<b>Total Emissions (ton)</b>	<b>3.97</b>	<b>0.33</b>	<b>1.02</b>	<b>0.34</b>	<b>0.37</b>	<b>0.36</b>

***Impact/Mitigation:***

The internal combustion engines in the equipment and vessels used in the Proposed Project will produce emissions as described above. However, these emissions would be less than 25 tons, i.e., below the threshold, and are, therefore, not considered significant (Class 3) and no mitigation is required.

**Long-term Impacts.** When the Proposed Project is completed, all equipment and support vessels will be removed from the site. An occasional water craft would be used to access the site for roosting/nesting platform maintenance. Trips associated with this activity are estimated to be on the order of one every three years. A minimal number of scientific trips may also occur assuming CDFG staff has a desire to access the platforms for this purpose. Long-term emissions that would be generated as a result of the Proposed Project would, therefore, not be significant.